THE ACQUISITION OF ENGLISH ADVERBS

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A DISSERTATION PRESENTED TO THE GRADUATE COUNCIL OF
THE UNIVERSITY OF FLORIDA
IN PARTIAL FULFILLMENT OF THE REQUIREMENTS FOR THE
DEGREE OF DOCTOR OF PHILOSOPHY

UNIVERSITY OF FLORIDA

1978

ACKNOWLEDGMENTS

TABLE OF CONTENTS

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December 1978

The English adverbial system presents some complex
problems for both the semanticist and the syntactician.
There is some evidence that difficulty in linguistic de-
scription is correlated with time of acquisition. The pur-
pose of this study was to investigate certain aspects of
that proposition.

The particular syntactic and semantic dimensions of this
study were very narrow. The syntactic question was: Is
there a difference in time of acquisition of one-word adverbs
as a function of syntactic form, i.e., morphemic items (e.g.,
almost) as compared to items derived by the 'basic rule' of
adverb formation, i.e., ADJ+-ly=ADV (e.g., nearly). The
semantic dimension covered five classes: manner, frequency,
extent, relative time, and sentential. The overall question
addressed in this study related to the possible relation

between adverb acquisition and general cognitive development.

The experimental procedure employed a newly devised test which was a variation of the sentence-picture matching task. Since adverbs refer either to processes or whole propositions, the task was adapted to a comparison of two four-frame panels, based on familiar newspaper cartoon characters and format. The two panels differed only with respect to the applicability of the adverb in the test sentence. The subjects for the study were 75 students in Grades 1, 2, 3, and 5.

The results of the study indicated that adverb form, adverb class, and the interaction of form by class are all statistically significant, as is the other main effect of grade. There was a significant improvement between Grades 1 and 2, and between Grades 3 and 5. Because of the significant interaction between adverb class and form, only general implications for these two main effects could be discussed. Adverb form may be of some slight advantage in acquisition: -ly forms produced somewhat lower error scores overall. Semantic class is very probably a factor: sentential items were most difficult; manner items were least difficult. The middle-difficulty items from the classes extent, frequency, and relative time are apparently the source of the significant interaction, and no definitive statement can be made on these items/classes from the results of this study. Other

data from the study suggest a strong connection between ability to process adverbs and general level of cognitive development. Certain definable stages in adverb acquisition are proposed.

CHAPTER I

INTRODUCTION

General Comments on Adverbs

The category 'adverb' is currently one of the most challenging areas in linguistic theory. It is not hard to understand why, considering that this category covers such a diverse range of semantic concepts and syntactic structures. As Nilsen (1972) noted, in his extensive paper on the surface phenomena of English adverbs:

> There seems to be a general consensus of opinion among grammarians (no matter what model they represent) that the most hetero-geneous, and the least understood of the traditional part-of-speech categories is, without question, the category Adverb. It has traditionally been the miscellaneous category into which those expressions were placed which could not easily be handled elsewhere in the grammar. This was done under the guise that these expressions in some sense 'modified' the verb. (p. 179)

In the most recent major attempt to account for adverbs, Huang (1975) observed that the category adverb '. . . can be defined . . . as the part of speech satisfying the semantic definitions for adverbs but failing to exhibit the inflectional or distributional properties of nouns, verbs, and adjectives' (p. 9). Huang comes close to saying that an adverb is anything that isn't something else!

1

While the situation with adverbs (ADV) might not be quite that chaotic, the category does present a number of difficult grammatical problems which stem from the diversity of the semantic concepts and syntactic structures which it covers.[1] My concern in this paper is with the question of the extent to which this 'problem area' within linguistic theory might also present problems for the language learner.

There is no strong evidence connecting difficulty in linguistic description with difficulty in acquisition, but some limited experimental evidence, plus simple intuition, suggests that such a connection exists. The wide range of semantic concepts under ADV seems to cover an equally wide range of cognitive difficulty. Similarly, it is possible, or even probable, that differences exist in the cognitive difficulty of the various syntactic structures of ADV. It would not be surprising, then, to find that there were patterns in acquisition for certain types and classes of ADV, and that these patterns were related to cognitive development.

General Aspects of ADV Acquisition

There is very little direct evidence on children and ADVs. But from two widely disparate areas, we can say with some surety that ADV acquisition begins very early and that mastery is late.

The evidence on early acquisition comes from the data Slobin (1971) reports on 'locative intentions' at the two-word

stage. That is, with appropriate environmental/circum-
stantial clues, an expression such as 'pot stove' is inter-
preted as 'the pot is on the stove'; 'doll drawer' means
'the doll is in the drawer.' Slobin also found the 'pro-
locatives' here and there at this early stage. Ervin-Tripp
(1970) observed the locative where in the sense of both place
and direction towards in very early language (at about age
3). This evidence may not be persuasive, but it is suffi-
cient to suggest that there is some expression of the con-
cept of ADV in very early language.

At the other end of the acquisition process, and
relevant to what goes on in between, there is the evidence
from a series of studies on the language production of grade
school children. These studies, related in intent, but not
identical in method, were reported by Harrell (1957), Loban
(1963, 1964), Hunt (1965), and O'Donnell, Griffin, and Norris
(1967). The conclusions that can be drawn from these studies,
relative to the point at issue here, is that there is a slow
but steady increase in both the number and forms of ADV used
by elementary school children with increase in grade. Ap-
parently, the acquisition of ADV is an on-going process that
continues all through the school years.

What I have said so far may seem a minimal defense of
why anyone would want to look at ADV acquisition. One ob-
vious reason is that no one has so far done so in any
systematic way. In what follows, I would like to consider
some more substantial reasons why the data on ADV acquisition

should be of more than casual interest. But first I will reiterate what I consider to be the basic questions. The first relates to the long period required for the mastery of ADV based on the data from the language production studies. Is there some inherent (cognitive) difficulty in the basic function of ADV as process modifier? Might it be that the young child is just 'not interested' in what ADV does to a sentence, and his 'need' to use ADV develops with his increasing awareness of, or concern with, the concepts that ADV conveys? Secondly, how does the semantic diversity of those various concepts covered by ADV relate to cognitive difficulty, and so to the long period of ADV acquisition? Finally, there is the question of the extent to which the complexity of the syntactic structures under ADV affects acquisition patterns. We have no firm evidence on any of these questions or issues, but in the next section, I will discuss these points as they relate to other data on lin-guistic and cognitive development, especially in the early school years, the age-range of interest in the study to be reported here.

The issues and items that I will consider here are for the most part at the most elemental levels of both semantics and syntax. Specifically, I will discuss the basic function of ADV; one of the most elemental of the semantic functions of ADV: time; and two aspects of elementary syntax: the ADV= ADJ+-ly rule and certain placement rules.

The Basic Function of ADV

An ADV is a 'process modifier': it sets the time frame, establishes/describes the manner, extent, etc. of a given string of words. By this definition, we really shouldn't expect very young children to be much concerned with ADV. Bronckart and Sinclair (1973), among others, have shown that young children are much more concerned with 'outcome' than with 'process,' and so we can at least assume that, until the child has reached the 'process-awareness' point in his cognitive development, ADV will play a very small role in his linguistic behavior.

There is a further aspect of this notion of 'process-modifier' that seems to relate to a well-accepted idea about cognitive development, and that is the observation that children go from concern with the concrete to an awareness of the abstract. This relates to the common conception in linguistic theory that the category ADV can be divided into 'VP-modifier' and 'proposition-modifier' (or S-ADV). While I recognize that there is considerable debate over just what is 'VP-modifier' or S-ADV, I am sure there is general agreement that such a distinction exists. The point of interest here is that 'VP-modifier' is more concrete than is S-ADV, and, therefore, should be acquired earlier. In defense of the greater complexity of S-ADV concepts, I would like to mention a distinction made by Schreiber (1970). S claims that there are two types of S-ADV, which he calls 'modal' and 'evaluative.' With 'modal' S-ADVs, the speaker is

expressing his 'degree of surety'; with 'evaluative' S-ADVs, he is expressing an opinion. If this interpretation is correct, and I feel that it comes very close, the child will not be able to correctly interpret S-ADVs until: 1) he reaches the point of recognizing that a comment is being made about the entire proposition; 2) in addition, he understands that this comment represents either an opinion, or just how sure the speaker is of what he is saying. I will have more to say about Schreiber's analysis in my discussion of the results of the present study.

Time, Tense, and Aspect

In order to assess the relative importance of semantics in the acquisition of ADV, it seems logical to look first at TIME-ADV, for the following reasons. 1) A significant subclass of ADVs relate to time; 2) time concepts are an important part of cognitive development; and 3) there are more data on this area of linguistic development than almost any other, certainly any that relate to ADV, in the age range of interest here.

A number of investigators, notably Piaget (1971), Barrie-Blackley (1973), Feagans (1974), and Keller-Cohen (1975), have described the child's developing time sense as it relates to general cognitive development. The very young child lives in a 'now/not-now' world. As Ervin-Tripp (1970) pointed out, before age 5, when is the hardest of the WH-questions for children to answer. She reports the following E-child exchange as an example: 'When did he eat?' -- 'Meat.'

Young children characteristically give concrete answers to abstract questions. They are concerned only with the 'here-and-now,' and so it seems a logical assumption that patterns in TIME-ADV acquisition would reflect this.

For the English speaking child, a sense of relative time, and, presumably, a sense or awareness of tense, apparently develops out of spatial concepts. Feagans (1974) studied the relation between temporal and spatial concepts, based on a theory first put forth by H. Clark (1970). Her conclusions were that items such as before and after were comprehended in the spatial sense before they had any meaning to the child in a temporal sense. These and other temporal connectives have been studied by Amidon and Carey (1972), Barrie-Blackley (1973), and Keller-Cohen (1975), with children in the 3-7 age range. The major conclusion of these studies, relative to the present study, is that young children do not fully understand temporal connectives. The implication is that relative time, and the associated ADVs, is in many cases incompletely understood by children in the early elementary grades.

Another significant factor in the child's comprehension of relative time is the interaction of ADV with tense and aspect. First, consider what Chafe (1973) discusses as what might be called the 'necessary TIME-ADV.' Chafe gives an amusing example, which I will loosely paraphrase. 'Dennis the Menace' announces to his parents: 'Mr. Wilson broke his arm!' The parents' immediate reaction is to rush to help

their neighbor--until Dennis' father asks 'When?' And Dennis says, 'When he was a little boy.' Chafe's point is that, to the child, if Dennis just learned about the incident, even though it happened long ago, it was 'new information' to him, and so that is how he stated it. The adult interpretation of such a statement is to regard it as 'in the present/ immediate past' unless some TIME-ADV locates it elsewhere. Still, both parents and child were dealing with 'past tense.' Nilsen (1972) notes that TIME-ADVs can express a 'time set' from distant past through distant future, with many interim points, and that specific items interact with tense and aspect. Obviously, the child has to become aware of the need, not only to 'locate' a statement in time (tense), but to learn just how exact that location need be, and just which ADVs can apply, given the interaction of tense and aspect.

In order to look at some practical examples of how tense, aspect, and ADV interact, I would like to consider the following sentences.

la. Mary has had mumps.

lb. Mary has had mumps before.

2a. Mary has been pregnant.

2b. Mary has been pregnant before.

3a. John is baking great pies.

3b. John is still baking great pies.

4a. Jack Nicklaus has won the Masters.

4b. Jack Nicklaus has already won the Masters.

In all of these S-pairs, the 'a' Ss make simple statements about past or present events. In the 'b' Ss, the ADV contributes additional implicit information, and introduces a dual time reference as well. For example, 1b. implies that, if Mary is now running a fever, she could not have mumps: that disease, once contracted, provides immunity. On the other hand 2b. implies that Mary has once again 'contracted' that particular condition. S-3a. merely makes a statement about John's present activities, but 3b. presupposes a common knowledge between speaker and hearer about John's activities/abilities at some prior time. S-4b. can have more than one interpretation in terms of 'new information' and 'dual time reference.' 1) Jack won the trophy at an earlier time, and if he wins it this time, 'What's one more green blazer?' 2) Since Jack has achieved this pinnacle of success, what more could matter? 3) With only one hole to go, how could anyone catch up with him?

It is interesting to note that those ADVs which introduce a dual time reference can also shift emphasis from past time to present, as in 1b. and 2b. In 3b., on the other hand, the shared knowledge of the past is stressed. The situation with the multiple interpretations of <u>already</u> is somewhat more complicated. I will discuss this ADV-item further in Chapter IV.

The major point to be made here is that words like <u>still</u>, <u>before</u>, and <u>already</u> introduce a double time reference. Just when is the child ready to handle this aspect of

'relative time'? There is very little experimental evidence on this question, but 'durative aspect' at least seems to be a problem for the young child. Feagans (1974) found that children under 5 do not understand the durative aspect, and that even 7-year-olds had trouble with the durative notions of since and until. I think the evidence from the work of Bronckart and Sinclair (1973) is relevant here, even though they were working with French-speaking children. They found that children (under 9) tend not to use tense to locate an action, state, etc. in time but rather to connote aspect. That is, the children associated past tense with completion and present tense with duration, regardless of the absolute time frame. They also found a tendency for children below 6 to use intonation and gesture to refer to 'aspectual distinctions'; above 6, children tended to use adverbial phrases for this purpose.

I could find no specific data on the items before and already, or on any other items in the class of relative time concepts, in the sense these notions are being discussed here. But I would strongly suspect that the child must develop well beyond the 'now/not-now' stage before he is able to comprehend items that refer to time relations between the present and the past.

One final element in the interaction of tense/aspect/ adverb deserves some comment, and that is the effect of ADV in potentially generic sentences. Smith (1964) showed that the presence of TIME-ADV in a sentence can determine whether

the sentence is generic, specific, or ambiguous. (Nilsen [1972] should also be credited with elaboration of this idea.) The sentences that follow are examples of the notions that Smith and Nilsen were considering.

5a.   The tiger stalked the jungle.

5b.   Long ago, the tiger stalked the jungle.

5c.   The tiger stalked the jungle at noon on Thursday.

6a.   The eagle ate small prey.

6b.   The eagle ate small prey in times of famine.

6c.   The eagle ate small prey at Bilbo's birthday party.

For the 'a' sentences, the reference is ambiguous relative to 'generic.' But for the 'b' sentences, the TIME-ADV allows only an unambiguous generic interpretation. Similarly, for the 'c' sentences, there is an unambiguous non-generic interpretation. Until the child is able to comprehend ADV, or at least becomes aware that it can convey a significant part of the information in a statement, he will see no difference in the 'specific' versus the 'general' in such statements.

The Syntax of ADV

The points I have been discussing so far have dealt primarily with how the semantics of ADV might present problems for the language learner. But as Slobin (1971) has noted, '. . . although one can talk about order of acquisition in terms of semantic or cognitive complexity, there is clearly a point at which formal linguistic complexity also plays a role' (p. 308). The research of C. Chomsky

(1969) and Kessel (1970) supports Slobin's notion. Both studies found that, for certain structures, there is a relation between formal complexity and time of acquisition. In what follows, I will argue that, even at the most elemental levels of syntax, ADV presents a major problem for formal description, but more importantly from the present perspective, that it might also be a syntactic problem for the language learner.

It would seem that the place to start any discussion of the elementary syntax of the English ADV would be with the so-called 'basic rule': ADV=ADJ+-ly. This rule certainly seems simple enough, but there are strange and inconsistent exceptions.

The rule is curious in this respect: it apparently applies, almost without exception, to all ADVs which are, in any sense, derived. It is the morphemic items to which the exceptions apply, and in no obvious fashion or systematic way. The significant point here is that this 'basic rule' applies most generally to those items that are least likely to be heard by young children: to the derived ADVs which are, for the most part, what would be considered 'advanced vocabulary.' On the other hand, those very items with which the child is likely to come into most frequent contact are the exceptions to the rule in question. What follows is a brief examination of some of the exceptions to the 'rule' which do seem to follow some sort of pattern, but not one which the child is likely to find very helpful.

There are certain sets of ADJ which also function as MAN-ADVs, with no morphological change, i.e., without '+-ly.' But for no discernible reason, these items fall into 3 classes. Consider the words in Table 1.[2]

TABLE 1

Adjectives Which Function as Manner Adverbs Without '+-ly'

A	B	C
ill	bright	deep
left	fair (unbiased)	fair
right (direction)	loud	fast
right ('directly')	quick	hard
well	right ('correct')	high
still	sharp	strong
straight	soft	wide

For items in A, no '-ly' is possible:

    7. Michael pleaded the case well (*-ly).

    8. He turned the car left (*-ly).

The items in B may take '-ly' optionally:

    9. The sun shone bright (-ly).

    10. The wind blew soft (-ly).

There are, however, some restrictions on the items in this 'optional' category with respect to freedom of placement.

    11. The sun brightly shone.

  *12. The sun bright shone.

    13. The boy quickly ran down the street.

  *14. The boy quick ran down the street.

Apparently the optionality of '-ly' for these items applies only when they are in post-V position. (I will discuss

placement rules more fully in a later section.) All items
in C can take '-ly,' but this results in a change in class.
For the most part, MAN goes to EXT.

Just for this small set of relatively common words,
which must surely become part of the child's vocabulary
rather early, there is a bewildering array of exceptions to
a very basic rule. There seems to be no pattern to these
exceptions, and so it is an interesting experimental ques-
tion as to what order and at what age they are mastered.

Another peculiar phenomenon, similar to that just dis-
cussed, involves verb-adverb phrases. Nilsen (1972) comments
that:

> Sometimes there is a rather tight affinity
> between the Manner Adverbials . . . and a
> verb, making it so that the V-ADV$_m$ con-
> struction is functioning as a sort of a
> Predicate plus Complement. (p. 81)

He gives an extensive list of such pairs, but makes no men-
tion of how they might be subdivided as a function of the
applicability of the '-ly' rule.[3] In Table 2 I have listed
some of the pairs from Nilsen's list which seem to function
differently with regard to the rule. The items in A cannot
take '-ly'; those in B can, and still remain post-V. For
the items in C and D, '-ly' is possible, but with a change
in meaning. For D, the '-ly' forms can remain post-V; for
C, they cannot. These pairs are all, as Nilsen noted, in
some sense 'locked phrases,' even 'idiomatic' to some extent
(or rather, in some cases). But it is interesting to note
how differently '+-ly' applies to the different subclasses.

TABLE 2

Verb-Adverb Phrases Which Function
as Predicate Plus Complement

A	B	C	D
blow shut	shine clear	make clear	work loose
sit tight	stand firm	make happy	prove false
turn red	rest easy	remain loyal	prove true
make fast	run slow	remain ignorant	break even
grow tall	glow bright	set free	continue warm
keep young	lie flat	cut short	come clean
fall sick			blow open

It is beyond the scope of this paper to try to explain these phenomenona. I mention it only as further evidence of just how difficult it must be to master the English ADV.

The one final comment I have to make on the vagaries of the '-ly' rule regards a small set of ADJs ending in 'y.' They are presented in Table 3, column A, and come from a list in Nilsen (1972, p. 80) labeled 'No Adverb Possible.' I agree with Nilsen that the items in A cannot take '+-ly,' at least, they sound very strange. And yet the items in B are also ADJ ending in 'y,' and the associated ADVs sound normal. I can find no semantic, syntactic, or phonological reason why, for example, <u>cloudily</u> should sound odd, but <u>handily</u> is common and accepted.

TABLE 3

Adjectives Ending in 'y' Which Can
and Cannot Take '+-ly'

A	B
baggy	angry
cloudy	busy
dirty	clumsy
dusty	handy
funny	happy
ugly	heavy
	noisy

The second area of elemental syntax that I would like to consider is the rules of ADV placement. In general, ADV placement in English is very free, as can be seen from Figure 1 on page 17. At the least, most items from most ADV classes can appear anywhere in the S. The apparent exception--the post-V position--is sometimes acceptable (for certain items) when the VP is sufficiently long, as in S-15.

15. John reads thoroughly those books which are related to his profession.

But there are definite restrictions on ADV placement relating to morphology, ADV class, and, to a certain extent, the problem of ambiguity.

The morphological restrictions on placement relate to the items discussed in the previous section, that is, those MAN-ADVs which are of the same phonetic form as their ADJ counterparts. For example, with the items soft and bright, both forms are possible in one sentence position, but not in the other.

S-ADV				
MAN	Surely	surely	*	,surely.
FREQ	Quietly	quietly	*	quietly.
EXT	Often	often	*	often.
TIME	?	fully	*	fully.
	Usually	usually	*	usually.

(Placement columns, left to right: S-ADV/MAN/FREQ/EXT/TIME grouping — Surely, Quietly, Often, ?, Usually) John (surely, quietly, often, fully, usually) read (* * * * *) the newspaper (,surely. quietly. often. fully. usually.)
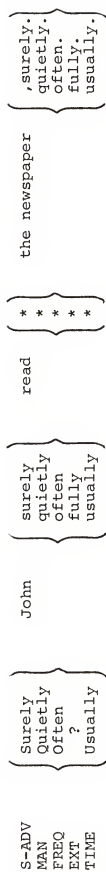
Fig. 1. Possible placements for English adverbs.

16. Sam sang the song soft.

17. Sam sang the song softly.

18. Sam softly sang the song.

*19. Sam soft sang the song.

20. The lamp glowed bright.

21. The lamp glowed brightly.

22. The lamp brightly glowed.

*23. The lamp bright glowed.

But with items like <u>hard</u>, there is a different 'rule':

24. Sam hit the nail hard.

*25. Sam hard hit the nail.

*26. Sam hit the nail hardly.

*27. Sam hardly hit the nail.

S-27 is, of course, acceptable, but only with a change in ADV class: from MAN to EXT.

Placement rules and restrictions which relate to ADV class and the problem of ambiguity are syntactically very interesting. Consider the following Ss:

28.	I naturally read the letter.	S-ADV
29.	I read the letter naturally.	MAN
30.	I read the letter, naturally.	S-ADV
31.	I discussed the subject frankly.	MAN
32.	Frankly, I discussed the subject.	S-ADV
33.	I frankly discussed the subject.	Ambig.: MAN/S-ADV
34.	John cooks rice regularly.	Ambig.: FREQ/MAN
35.	John regularly cooks rice.	FREQ.

There seem to be no logical reasons for the placement

restrictions which apply to ADV as a function of class, or to those which disambiguate. It would seem that the child simply has to memorize all such exceptions. But Nilsen has contributed what may be a valuable insight on this particular 'problem' for the language learner. He notes that there are, for certain ADV classes, positions within the S which are 'more natural.' And so, by his analysis, S-final is 'more natural' for MAN-ADV, and 'pre-V' is 'more natural' for FREQ-ADV. The trouble is that, at least for the Ss I have chosen as examples of 'the problem,' his solution doesn't seem to help very much. In comparing S-33 with S-31, it is true that it is <u>possible</u> to disambiguate, but S-33 is a perfectly good way of expressing the notion of S-31. With the other ambiguous S, S-34, compare it with S-36, which is perfectly acceptable.

    36. John cooks rice frequently.

The point is that, what Nilsen suggests as to 'natural placement' may well be an idea worth pursuing in the area of ADV acquisition. However at this point it does not seem likely that it will be a 'hard and fast' rule. There are few such rules in the area of language.

The Present Study

    In the previous section I have shown some of the syntactic and semantic reasons why ADV is a difficult category for the English-speaking child to master. There is evidence that certain items in this category appear in very early

language, but that mastery of the category is very late. In sum, ADV is a complex linguistic category, for the child and for the linguist, and there is good reason to believe that the child's acquisition of the category ADV is closely related to cognitive development.

Purpose

The purpose of the present study is to make a systematic investigation of what seem to be the basic aspects of ADV acquisition. The most fundamental questions are, of course, those put forth at the beginning of this chapter:

1. To what extent does the basic function of ADV interact with cognitive development?

2. What is the relation between ADV class and cognitive difficulty?

3. What is the relation between differences in syntactic structures of ADV and cognitive difficulty?

Specifics of the Present Study

Since this study is the first attempt at evaluating ADV acquisition in a systematic way, certain decisions had to be made as to how best to approach the questions presented above. It seemed that the most fundamental comparison of syntactic structures would be between one-word items that differed only in terms of 'morphemic' or 'ADJ+-ly.' Semantically, the decisions were somewhat more complex, but 5 classes were chosen for the following reasons:

MAN--There is some scant evidence that items in this

class appear early. There are also logical reasons why MAN-ADVs seem to be more closely associated with their ADJ counterparts. They are, as a class, associated with the (presumably) simpler concept of VP-modifier.

REL. TIME/FREQ--These items relate to the one area in which there are some data on children and ADV, indicating that TIME is a significant factor in ADV acquisition in the early school years.

EXT--There is evidence that this concept grows out of earlier concepts of TIME and SPACE, and so it is potentially interesting in this period of language development.

S-ADV--There is good reason to believe this class covers the most complex of ADV concepts, and so might be one of the last to be mastered.

The Questions

Given the above criteria, the particular questions addressed in this study were:

1. Are there differences in time of acquisition as a function of the two syntactic forms: 'morphemic' and 'ADJ+-ly'?

2. Are there differences in time of acquisition as a function of the five semantic classes: MAN, EXT, REL. TIME, FREQ, and S-ADV?

3. Is there evidence for a relation between linguistic and cognitive development in relation to ADV acquisition?

Notes

[1]The terms 'adverb' and 'adverbial' are not used consistently in the literature. Both terms can cover both items and phrases. Some writers make a distinction between adverbial phrases and one-word adverbs. In this paper the more traditional 'adverb' (ADV) will be used to refer to all forms, with the item/phrase distinction made clear where pertinent. In the study proper, only one-word ADVs are considered.

[2]The tables in this chapter are not inclusive. That is, I have not attempted to find all possible items which might fit any particular cell.

[3]Nilsen (1972, p. 81) acknowledges that this list and the observations on this relationship should be credited to Fries (1952) and Fraser (1965).

CHAPTER II

THE STUDY

The Method

This study deals with an area that is both broad and ill-defined. Even though the restrictions and specific questions stated in the previous chapter impose some limitations, certain basic decisions remain as to the best way to approach problems in this area. The first and most important is whether to look at language from the perspective of production or of comprehension. For this particular question, a brief examination of the available lists on child language, in particular, Wepman and Hass (1969) and Rinsland (1945), showed that the percentage of ADVs in child language output is so small that a production study was impractical. Moreover, a study of comprehension seemed to have two further advantages. It is somehow more realistic and it is easier to control. Comprehension data are more 'realistic' than production data in this age range in the sense that what we are concerned with here is just when a child understands the effect of ADV in a S. And a comprehension study is easier to control because the child's attention can be directed to just those linguistic situations in which ADV is critical.[1]

The remaining decision, then, was how best to measure comprehension of ADV as a 'process modifier.' It seemed that the logical choice was a task that comes closest to everyday language, and, by this criterion, the picture-sentence matching task was most appropriate. This task is very similar to the 'real-life' situation, in which the child must respond to what he hears, in the way he currently (at his present acquisition level) understands it.

The Subjects

The subjects for this study were students at the P. K. Yonge Laboratory School at the University of Florida. The final analysis was made on the data from 15 first graders and 20 children in each of grades 2, 3, and 5. Eight eighth graders were also tested, since this age group could be considered 'linguistic adults.' Their data represent a 'test of the test,' that is, a demonstration that, for adults, who presumably have full command of the English ADV system, this test is a simple linguistic exercise.

There were some children tested whose data were not included in the analysis. For example, all the children whose data were included were white. A few black children were tested for social reasons, but since there is no evidence either way on the effect of the Southern black dialects on performance in language acquisition studies, it did not seem appropriate to include them in this study.[2]

There were several children I tried to test, but who, for one reason or another, were unwilling or unable to cooperate. This was clear by the end of the 6 practice items, and for them, the session ended there. This group includes a few kindergarteners: it seems that this type of test is inappropriate below age 6, and I suspect the major problem is attention span.

Finally, the male/female division is not equal for all grades. The breakdown of sex by grade is presented in Table 4.

TABLE 4

Subjects by Grade and Sex

Grade	Male	Female
1	6	9
2	10	10
3	10	10
5	10	10
8	3	5

The reason that there are fewer males than female subjects in Grade 1 is that the girls were generally more cooperative, and the boys more likely to be intimidated by the test situation at this age. For Grade 8, there did not seem to by any good reason to assume male/female differences would be relevant, and so no attempt was made to balance for sex in that age group.

The Test

As was mentioned earlier, it seemed that the best method
for evaluating the present problem was a sentence-picture
matching task, especially for the age range of interest here.
But with the added complication of assessing 'process modi-
fier,' some elaboration of the usual method was necessary.
So instead of contrasting two or more single-frame pictures
against a S, two panels of 4 frames, in the manner of news-
paper cartoons, were constructed for each test S. An addi-
tional advantage of this approach was that it allowed me to
use familiar cartoon characters which would be more likely
to catch the childrens' interest.

Given the restrictions and the particular questions
stated in Chapter I, specific items for the 5 ADV classes
and 2 syntactic forms had to be selected which were arguably
items a young child would hear relatively often, or could be
expected to use relatively early, by some objective criterion.
The choice of items was made after consulting the lists
formulated by Jones and Wepman (1966), Wepman and Hass (1969),
and Rinsland (1945). But all such lists are based on pro-
duction, and more importantly, Wepman's lists are restricted
to responses to the TAT, where the possibility of ADV
occurring is limited.[3] The problem with Rinsland's lists
is that he makes no distinction between syntactic categories.
So the final choice of items for this test was based on what
these lists suggested, plus a large degree of intuition.

Once the 24 ADV-items had been chosen, a S was con-
structed for each in a standard form: NP-ADV-VP. The ex-
ception to this format was that for morphemic-MAN items the
ADV had to appear at the end of the S, as was discussed in
Chapter I. Also, since S-ADVs seem most natural in S-initial
position, that is where they occur in the test Ss here. The
ADV items by form and class, and their position in the test
Ss, are presented in Table 5. The list of test Ss can be
found in Appendices A and B.

The basic form of the test was a page containing the
two 4-frame cartoon panels (which will be referred to as
'panel-sets'), with the panels placed one above the other.
The panels were prominently labeled A (above) and B. Each
page corresponded to one of the test Ss. The sequences in
the panels were variations of familiar cartoon characters,
and depicted the events, actions, or situation in the
corresponding S. The sole difference between the panels
on a given page was the applicability of the ADV in the
corresponding S. Thirty panel-sets/pages were constructed,
one for each of the ADV test items, plus 6 which were used
for a practice session. For the 6 practice pages, the panels
differed with respect to the appropriate subject, verb, or
ADJ, but never ADV. The purpose of these pages was to make
certain that, before beginning the test proper, the child
fully understood the task, i.e., of selecting which of the
two panels best fit the S he heard.

TABLE 5

Adverb Items by Class and Form with Sentence Frames

Class	Form		Sentence Frames
	ADJ+ly	Morphemic	

MAN	carefully
	quietly
	quickly
	happily
		hard
		high
		fast
		straight
			ADJ+ly:
			  Subj-ADV-Verb'ed-Obj
			Morphemic:
			  Subj-Verb'ed-Obj-ADV

EXT	nearly completely	almost only	Subj-ADV-Verb'ed-Obj
REL. TIME	finally suddenly	already still	Subj-ADV-Verb'ed-Obj
FREQ	rarely usually	seldom often	Subj-ADV-Verb'ed-Obj
S-ADV	certainly probably	perhaps maybe	ADV-Subj-Verb'ed-Obj

The Ss were presented in semi-random order. That is,
they were arranged so that the same subject or verb never
appeared in adjacent Ss, and the class and form of the ADV
occurred in reasonably random order. The 'right answer,'
i.e., the A or B panel, was truly random. Since there was
some question that particular lexical items might interact
with the panel-sets with which they were associated, a second
form of the test was arranged by interchanging antonyms and
synonyms. For example, the panel-set for rarely on Form 1
was used for usually on Form 2, since the sequence depicted
in that panel-set was equally appropriate to either ADV, but
the 'right' answer would be the opposite panel. This inter-
change was possible for only 14 of the 24 items, but that
seemed sufficient to be able to answer the question of

possible interaction. The Ss for both forms of the test are presented in Appendices A and B. The panel sets were presented in the same order for all subjects; the ordering of the Ss was changed accordingly for the two forms.

Procedure

One of the special advantages of conducting research at the P. K. Yonge School is that each classroom has an adjacent teacher's office that is available for testing sessions. The rooms have child-size tables and chairs, and so for each session, the child and I could sit side by side, with the notebook of panel-sets before us.

At the beginning of the session, I opened the notebook to a page on which were drawn all of the cartoon characters which would appear in the panel sets. Since these were familiar characters, I asked the child if he could name them. Most children above first grade could, and seemed to enjoy doing so. Even the first graders knew at least some of the 'people.' It should be stressed, though, that this 'I.D.' page was intended only as a means of catching the child's interest. In no case in the test that followed was it critical that the child know the name of any particular character.

After discussing the characters, I told the child I would be showing him some pictures with the 'people' in them and would be asking him questions about the pictures. I turned to the first practice page and explained that all

of the pages would be the same, with one panel above marked
A and one below marked B. We then went through the 6
practice pages. For each page, I said, 'If I said (relevant
S), which panel do you think would go with that, A or B?'
No matter what his answer, I told him which was the right
panel, and we discussed why. If at the end of the 6 practice
pages, the child did not obviously understand the task,
giving the right answer and correctly explaining why, that
child was not included in the study. That is, in no case
were data included if there was any question as to whether
the child understood the task. At the end of the practice
session, I told the child that the rest of the pages would
be like the ones we had just seen, but I would no longer
tell him the right answer, ' . . . because I want to know
what you think is the right answer.' In all cases, no
matter whether the answer was right or wrong, I responded
with a 'noncommittal,' but 'positive-sounding' 'OK, let's
look at the next page.'

In addition to recording which panel the child selected,
I also noted any voluntary comments that were made, and,
occasionally, but in no systematic manner, asked, 'Why do
you think that is the right panel?' In many cases, the
children offered comments or explanations without being
asked.

The eighth graders were an exception to the procedure
just described. For every item, they were asked to explain
why they chose as they did, since, as I mentioned earlier,

their data were to be a measure of the validity of the test.

The overall response of the children to the test was very encouraging. It was not uncommon for a child to ask when the test was over, 'Is that all? Aren't there any more?' To the extent that 'subject involvement' relates to test reliability, this evidence reflects favorably on the results that I will report in the next chapter.

Notes

[1]The question of whether comprehension precedes pro-
duction is not at issue here. In fact, it may well be a
nonissue. Early production of a linguistic form does not
indicate full comprehension, nor does the reverse hold. For
this paper, what is important is determining whether there
are progressive stages, or patterns, in ADV acquisition, and
what applies to comprehension should, in a general way,
apply equally to production. But that is still an empirical
question, and will be discussed further in Chapter IV.

[2]An examination of the data from those few black chil-
dren indicated that they tended to score well below their
white peers. I have no explanation for this, but there were
strong indications that dialect differences were a factor.
This, I feel, supports my early decision not to include
these children in the study/analysis.

[3]The Thematic Apperception Test (TAT)(Murray, 1943) is
a series of pictures, each depicting a specific situation,
which is widely used to elicit language samples for various
purposes. But since the pictures are essentially 'static,'
there are few cues which could be expected to elicit ADVs.

CHAPTER III

RESULTS

Preface

The observations from this study fall into two cate-
gories: 1) the objective measures, i.e., the error scores
for each test item, and 2) the voluntary comments and other
responses the children made in relation to the individual
test items. Only the error scores were analyzed statis-
tically, and the results of those analyses will be considered
first. The children's comments and other responses, and the
relevance of these data to the error data, will be discussed
later.

The Error Scores

The objective results of the study are presented in
Table 6. The mean error scores represent the proportion of
trials in which an incorrect response was given. The scores
are listed for each grade and each test item, with an indi-
cation of the divisions by ADV class and form. Table 7 gives
the means for ADV class and form, across individual items.
These are the data on which the final analyses were run.

An analysis of variance (ANOVA) was conducted to deter-
mine the effects of the several factors in this study. Since

TABLE 6

$\overline{X}$ Error Scores by Test Item by Grade

Adverb Class/Form	Test Item	Grade			
		1 N=15	2 N=20	3 N=20	5 N=20
Manner	carefully	0.27	0.20	0.10	0.00
	quietly	0.07	0.00	0.05	0.00
-ly	quickly	0.00	0.15	0.00	0.05
	happily	0.33	0.20	0.15	0.10
	hard	0.00	0.05	0.05	0.00
morph.	high	0.00	0.00	0.00	0.00
	fast	0.13	0.00	0.10	0.00
	straight	0.07	0.10	0.00	0.05
Extent	nearly	0.73	0.20	0.25	0.05
-ly	completely	0.13	0.15	0.20	0.00
morph.	almost	0.53	0.30	0.20	0.00
	only	0.53	0.40	0.45	0.25
Rel. Time	finally	0.47	0.55	0.45	0.20
-ly	suddenly	0.60	0.40	0.45	0.25
morph.	already	0.20	0.35	0.10	0.10
	still	0.20	0.15	0.15	0.00
Frequency	rarely	0.73	0.40	0.40	0.15
-ly	usually	0.33	0.10	0.05	0.00
morph.	seldom	0.87	0.90	0.80	0.45
	often	0.33	0.20	0.15	0.10
Sentential	certainly	0.40	0.20	0.20	0.15
-ly	probably	0.80	0.70	0.80	0.80
morph.	perhaps	0.93	0.85	0.70	0.65
	maybe	0.80	0.90	0.80	0.55

TABLE 7

$\overline{X}$ Error Scores for Adverb Form and Class by Grade

| Grade | Adv. Form | Adverb Class | | | | | |
		Man.	Ext.	Rel. Time	Freq.	Sen.	$\overline{XX}$
1	-ly	0.17	0.43	0.53	0.53	0.60	0.45
	morph.	0.05	0.53	0.20	0.60	0.87	0.45
	$\overline{X}$	0.11	0.48	0.36	0.56	0.74	0.45
2	-ly	0.14	0.18	0.48	0.22	0.45	0.29
	morph.	0.04	0.35	0.25	0.55	0.88	0.41
	$\overline{X}$	0.09	0.26	0.36	0.38	0.66	0.35
3	-ly	0.08	0.22	0.45	0.22	0.50	0.29
	morph.	0.04	0.32	0.12	0.48	0.75	0.34
	$\overline{X}$	0.06	0.27	0.28	0.35	0.62	0.32
5	-ly	0.04	0.02	0.22	0.08	0.48	0.17
	morph.	0.01	0.12	0.05	0.28	0.60	0.21
	$\overline{X}$	0.02	0.07	0.14	0.18	0.54	0.19
	$\overline{X}$ -ly	0.10	0.20	0.41	0.25	0.50	
	$\overline{X}$ morph.	0.03	0.32	0.15	0.47	0.77	
	$\overline{XX}$	0.07	0.26	0.28	0.36	0.63	

the design was unbalanced, i.e., the N for Grade 1 was less than that for the other three grades, the ANOVA was conducted by means of a general linear model: a regression analysis. In the course of this analysis, the main effects (test form, sex, grade, ADV form, and ADV class) and all possible combinations of 2-, 3-, and 4-way interactions were tested. Any main effect or interaction that was not significant was dropped from the model. Those terms that appear to be significant ($\alpha = 0.01$) are reported in Table 8. As a result, the ANOVA indicated that the factors of grade, ADV form, and ADV class, as well as the interaction of form by class, are the only variables that are significantly related to the responses to the test items. But the ANOVA results say only that some means are significantly different for any variable. Therefore the Duncan Multiple Range Test was used to identify just where the real, or statistically significant differences lay. This test was run to ascertain which grades were actually different from each other, and where the differences were in the ADV form by ADV class interaction. The results of these tests, along with the graphic representations, are shown in Figures 2 and 3, respectively. It seems clear that the ability to process the ADVs included in this study improves significantly between Grades 1 and 2 and between Grades 3 and 5. The significant differences for ADV form and ADV class are complicated by the form by class interaction, and that subject requires some clarification.

TABLE 8

ANOVA for Grade, Adverb Form and Adverb Class

Source	S.S.	df	m.s.	F
Grade	6.19	3	2.06	29.33*
ADV Form	0.59	1	0.59	8.36*
ADV Class	25.30	4	6.32	89.87*
Form X Class	7.14	4	1.78	25.35*
Error	51.86	737	0.07	---

*significant at $\alpha = 0.01$

Although the statistical results/ANOVA indicate that both ADV form and ADV class are significant factors in the acquisition of the particular items included in this study, the significant interaction of form by class means that the differences in these main effects can only be considered as trends, and that any real differences for these two variables are masked. That is why the Duncan Test results take on special importance.

In Table 9, the individual test items are ranked by mean score and Duncan grouping. This makes it possible to compare means, both for items within cells and for items across cells. Thus the table points up the fact that differences between means for individual items may be an important factor in the interpretation of the significant interaction of ADV form by ADV class.

Before considering the implications of that significant interaction, we can look at what seem to be the most obvious conclusions to be drawn from this table. Clearly S-ADV items
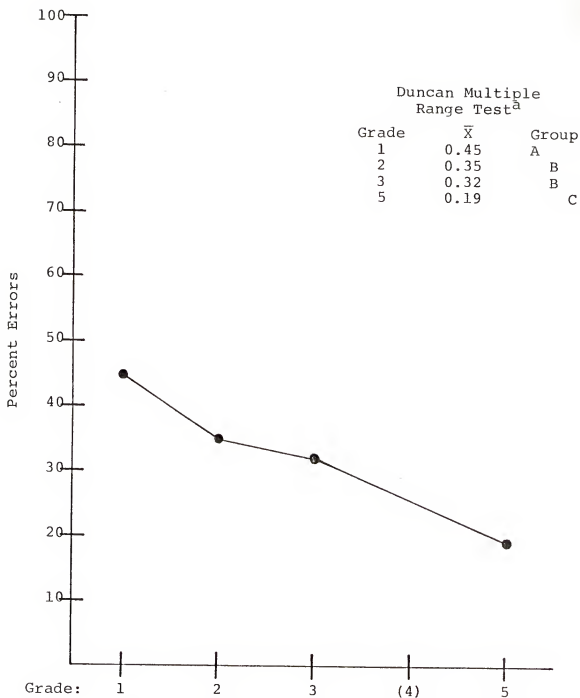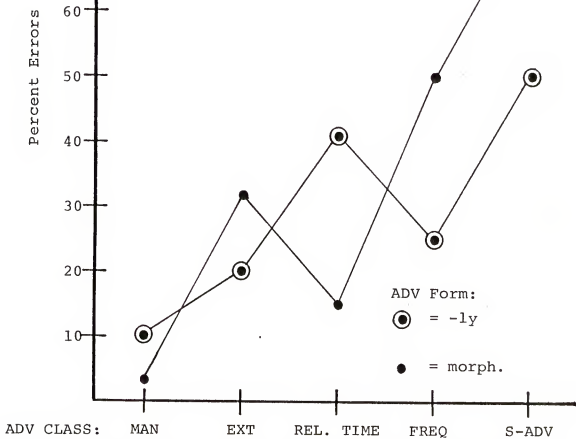
^a$\overline{X}$'s which do not share a common letter in the grouping are significantly different; those which do are not (α = 0.01)

Fig. 2. $\overline{X}$ errors by grade with associated Duncan Multiple Range Test results.

Fig. 3. $\overline{X}$ errors by ADV form and ADV class with associated Duncan Multiple Range Test results.

TABLE 9

Comparison of Duncan Groupings with Item $\bar{x}$'s

Class-Form	$\bar{x}$'s	Duncan[a] Grouping	Items	$\bar{X}$ Error Scores
S-ADV-Morph.	0.77	A	perhaps	0.78
			maybe	0.76
S-ADV-ly	0.50	B	probably	0.78
			certainly	0.24
FREQ-Morph.	0.47	B	seldom	0.76
			often	0.20
REL.TIME-ly	0.41	BC	finally	0.42
			suddenly	0.42
EXT-Morph.	0.32	CD	almost	0.26
			only	0.41
FREQ-ly	0.25	DE	rarely	0.41
			usually	0.12
EXT-ly	0.20	EF	nearly	0.31
			completely	0.12
REL.TIME-Morph.	0.15	EF	already	0.19
			still	0.12
MAN-ly	0.10	FG	carefully	0.14
			quietly	0.03
			quickly	0.05
			happily	0.20
MAN-Morph.	0.03	G	hard	0.02
			high	0.00
			fast	0.06
			straight	0.06

[a] $\bar{X}$'s which do not share a common letter in the grouping are significantly different; those which do are not ($\alpha=0.01$).

were the most difficult in this test,[1] and MAN, at least,
morphemic MAN, were easiest. All that can reasonably be
stated in terms of ADV form and class is in the sense of
trends, and these are presented in Figures 4 and 5. The
overall pattern in Figure 4 shows that morphemic differences
are not obvious across the grades. On the other hand,
Figure 5 shows some very clear differences as a function of
ADV class. This apparent contradiction between statistics
and graphic presentation can be explained, at least in part,
by a more careful examination of Table 9.

If the Duncan groupings are compared with the item
means (see especially _certainly_, which I have already men-
tioned), it is apparent that in many cases specific item
differences within class/form cells can be quite large.
This argues for two tentative conclusions: first, that ADV
form is not, in and of itself, a significant factor, but
rather it interacts in a special way with the items in this
test; second, no firm statements can be made relative to
ADV class other than S-ADV and MAN. However, the possible
implications of the results for the middle-difficulty items
will be discussed in Chapter IV, in conjunction with data
to be reported later.

During the spring of the previous school year, 16 of the
third graders included in this study had been given the Otis-
Lennon Mental Ability Test (OLMAT). The scores for this test
are reported as percentile rankings relative to national norms.
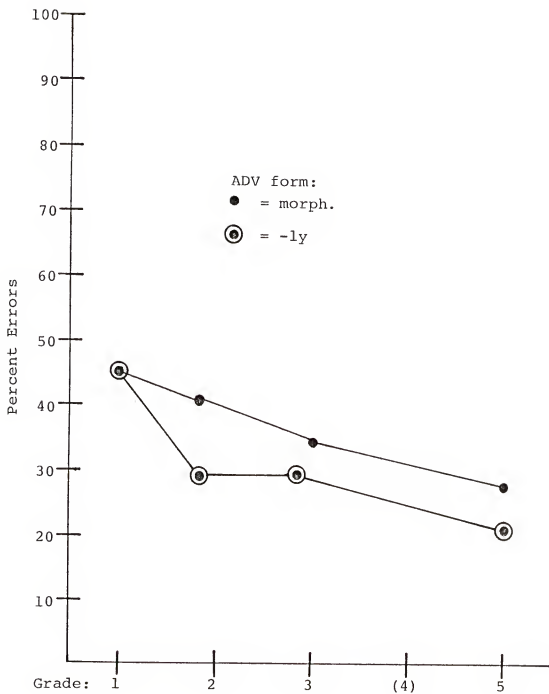The test is group-administered, and not particularly sensitive,

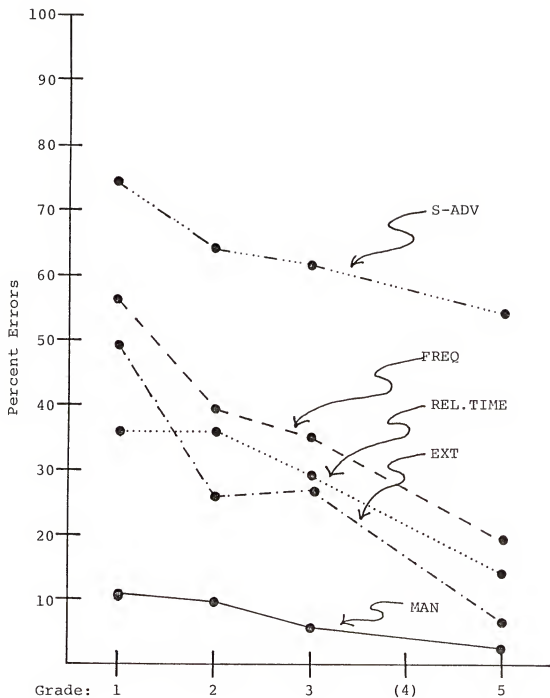Fig. 4.   Percent errors by grade as a function of
ADV form.

Fig. 5. Percent errors by grade as a function of ADV class.

but it does provide a reasonably reliable ranking of the child's mental ability.

An analysis of covariance (ANOCOVA) was conducted on the two sets of scores available for this grade: the error scores from the present study and the OLMAT percentile ranks. The results are presented in Table 10. Apparently, mental aptitude is a significant factor in the ability to process the ADV items in this study for children of this age. The results indicate that, while there is no apparent effect of ADV form when mental ability is one factor in the analysis, ADV class is still a significant variable, and the interaction of ADV form by class still holds, as it did in the ANOVA.

TABLE 10

Analysis of Covariance for OLMAT Scores,
Adverb Form and Adverb Class

Source	S.S.	df	m.s.	F
OLMAT Score	0.80	1	0.80	10.46*
ADV Form	0.14	1	0.14	1.84
ADV Class	5.16	4	1.29	16.85*
Form X Class	1.99	4	0.50	6.51*
Error	11.41	149	0.08	---

*significant at $\alpha = 0.01$

Because of this significant interaction, it is necessary to discuss the relation between the two significant main variables, ADV class and OLMAT score, separately for each of the five ADV classes. In Figure 6, regression lines have been plotted for each class as a function of OLMAT

score. A regression line, it should be noted, is a <u>straight</u>
line of best fit for data points plotted on two variables,
and the slope of the line reflects degree of change in one
variable relative to change in the other. Figure 6 indicates
only slight differences in MAN and S-ADV scores as a function
of mental aptitude. This merely reinforces the ANOVA results
that MAN is already 'acquired' by Grade 1, and that S-ADV is
almost as much of a problem at Grade 5 as it is for the
younger children. For the 'middle-difficulty' classes, the
graphic representations suggest that ability to handle FREQ
does not change much as a function of general mental ability,
but that there is a somewhat more obvious change for EXT and
REL. TIME.

It was noted in Chapter II that 8 eighth graders were
tested in order to establish an 'upper-limit' for the test.
Since these 13-14-year-olds could reasonably be considered
'linguistic adults,' their data were intended as a 'test of
the test': that what was at issue here was really an ability
to process ADVs. All of the subjects in this group were
asked to explain their reasons for choosing a particular
panel. Two subjects gave the correct responses and explana-
tions for all items. One subject gave an aberrant but very
interesting pattern of responses, and he will be discussed
later. The remaining five subjects gave correct answers and
explanations to all but one or more of the critical S-ADVs
(i.e., excepting <u>certainly</u>, which all correctly explained).
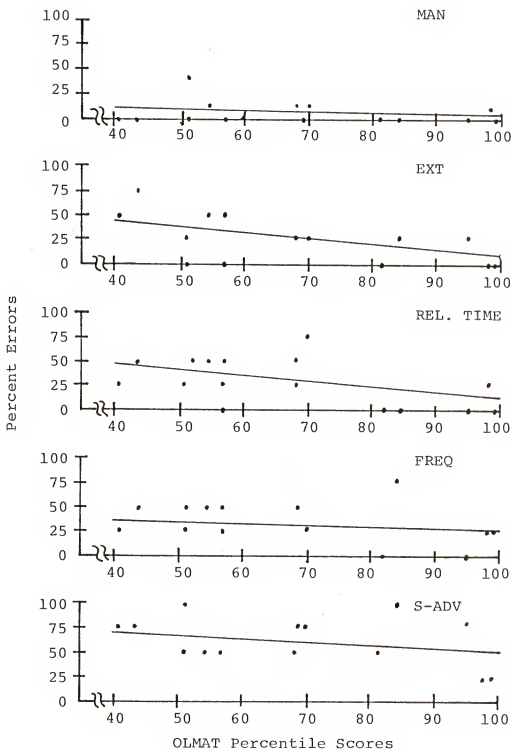The eighth graders did, in fact, 'validate' the test as a

Fig. 6. Percent errors as a function of OLMAT percentile score for the five classes of ADV.

task involving the ability to process ADVs. The fact that
so many of them had trouble with at least one of the S-ADVs
is particularly interesting when compared with their comments.
That issue will be treated in a later section.

The Voluntary Data

The second form of data that this study produced was
the comments and other voluntary responses that the children
gave. These data were not an integral part of the experi-
mental design, but all comments and reactions the children
made during the test session were noted. For the most part,
these data can be accurately described as 'voluntary re-
sponses.' However, some children were asked to explain
their choices, but this was not done in any systematic way.
Even for those children who were asked to explain, I did not
insist that they do so.

These spontaneous or solicited responses cannot be taken
as anything more than corroborating evidence for the major
statistical results, and the analysis of these data was as
loose as the method by which they were collected. These
data are primarily 'impressionistic.' Nevertheless, there
seem to be some definite and intriguing patterns in these
responses, and they will be reported in terms of certain
patterns or tendencies which seem to change with grade.

For Grade 1, the apparent tendency is to attend primarily
to the verb. Typical comments for average-score subjects in
this age group are presented in Table 11. It should be

TABLE 11

Sample Comments by First Graders

Snoopy carefully put the bird in the next.
    'because he's lifting it up'
    'because he put it in (B-3); there (A-3) blew it out'
Snoopy quickly ran to kick the ball.
    'because he's kicking it'
Lucy happily listened to Schroeder play.
    *'because she's listening to it'
    *'because she's looking at him in B and listening in A'
Snoopy nearly fell off his doghouse.
    *'(pointing emphatically to A-4) where it <u>did</u> happen'
The fire completely burned Snoopy's doghouse.
    'because it's burning his house'
Linus only hit the ball.
    *'he's just hitting the ball'
    -subject repeated the S without ADV
Linus finally found his blanket.
    *'because he found it'
    *'both the same'
Linus seldom helps his mother-
    (A-1) 'because he's vacuuming'
    *'he's doing laundry and stuff' (indicated B-1, B-2, B-4)
Lucy rarely plays with Linus.
    *'because (in three frames) she's playing'

---

    * = wrong response
    (A-1) refers to the first frame of panel A, etc.

---

noted that a response of 'they are both the same' was con-
sidered a wrong response, i.e., an indication that the
subject was not processing the ADV, since the panels in a
set differed only with respect to the ADV. There was also
a strong tendency for these children to point to the
critically <u>wrong</u> frame in a panel for S-ADV panel-sets and
other 'implicit NEGs,' and to do so emphatically. This issue
will be discussed in more detail in the next section.

The most prominent change in the comments by average scorers in Grade 2, compared to Grade 1, was their tendency to mention the ADV, usually as a question after the test-S had been read to them, but also as the 'reason' for their response. Also, there were more correct explanations of right responses, occasionally with correct definitions of the ADV-item. This was still infrequent, but certainly an increase over the average first grader. But there was still a definite indication of 'verb-processing' and 'both the same' responses, especially for those items that were 'hard,' as indicated by the error score data.

The change in pattern from Grade 2 to Grade 3 is primarily one of degree. Here the children more frequently mentioned the ADV, either repeating it to themselves, asking what it meant, or using it as the reason for their responses.

By Grade 5, almost invariably, if the children made a comment, it was to repeat or question the ADV. For the most part, they volunteered, or could give on request, good explanations for their choices. But one other notable change for this age group was that, as error scores decreased, there was a decreased likelihood of any comment being offered or mention of the ADV being made. Evidently, as 'processing ADV' becomes more automatic, 'ADV awareness' decreases.

The Relation between the Two Forms of Data

The two forms of data collected in this study tend to be mutually supportive, but in one area more than others. Certain items in this test can be classified as 'implicit NEG,' i.e., if that item were deleted, the test-S would go from a negative to a positive statement, as in the following:

37a. Snoopy nearly fell off the doghouse.

37b. Snoopy fell off the doghouse.

38a. Linus rarely helps his mother.

38b. Linus helps his mother.

39a. Probably Snoopy grabbed the blanket.

39b. Snoopy grabbed the blanket.

These three types of 'implicit NEG' are, of course, not equal in degree or type of negative, and that distinction will be discussed in the next chapter. But if it is true, as the comments from the first graders seem to indicate, that, early on, the strategy is to 'process the S without ADV,' then we might expect to find: 1) higher than average error scores on these items for the young children, and 2) that errors would decrease across grade. In addition, the comments of older children on these items should give some indication of the process of ADV acquisition.

The items which fall under this category are presented in Table 12, along with mean error scores for Grades 1 through 5. The eighth graders made no errors on the non-S-ADV items, and their scores on the S-ADV items will be reported with

their comments. The trends in the error scores for these
items are presented in Figures 7 and 8.

TABLE 12

Error Scores by Grade for 'Implicit NEG' Items

Class	Item	1	2	3	5
EXT	nearly	0.73	0.20	0.25	0.05
	almost	0.53	0.30	0.20	0.00
FREQ	rarely	0.73	0.35	0.40	0.15
	seldom	0.87	0.90	0.80	0.45
S-ADV	probably	0.80	0.70	0.80	0.80
	perhaps	0.93	0.85	0.70	0.65
	maybe	0.80	0.90	0.80	0.55

Although each of the ADV classes covered here is
arguably 'implicit NEG,' each class differs subtly in
'degree' or 'type' of negative. For example, the EXT items
are true NEG, i.e., S-40 is positive, while S-41 is negative:

    40. Snoopy fell off the doghouse.

    41. Snoopy nearly fell off the doghouse.

The FREQ items have a less obvious NEG effect, though for
the linguistic decisions required in this test, they also
function as implicit NEG: the correct panel-set for the
test-S for these items showed an event happening once versus
three times. The S-ADVs are NEG in an even more subtle
sense. Since they represent 'speaker doubt' or 'degree of
surety,' the statement that followed could not be judged
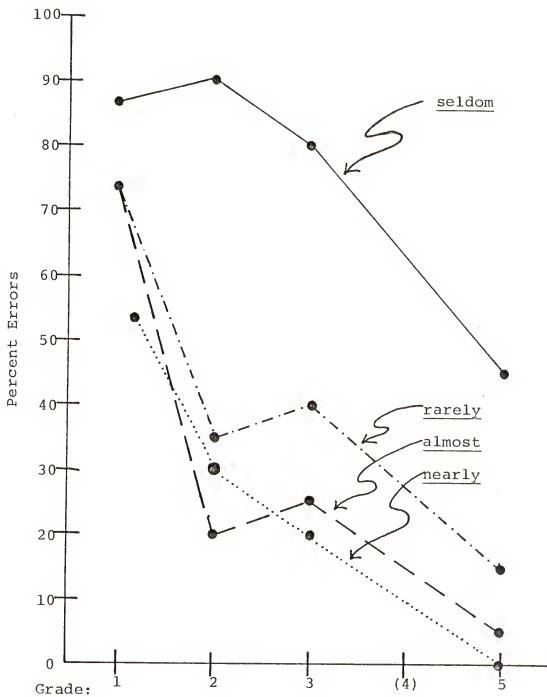positive. By default, the 'positive' panel was the wrong
answer.

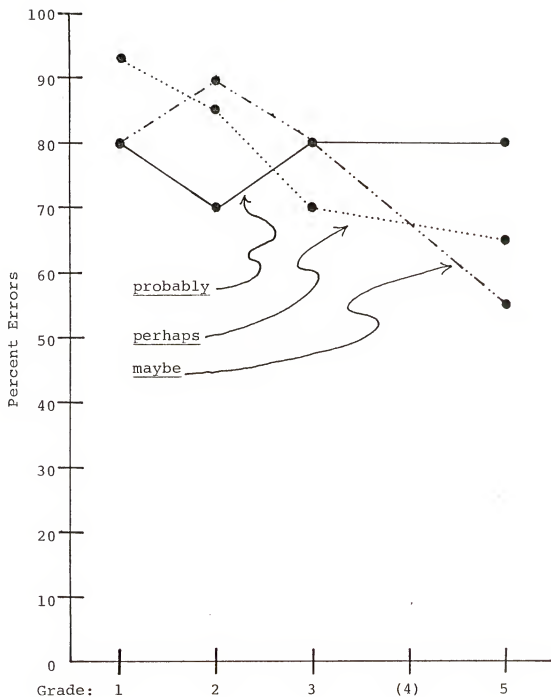Fig. 7. $\overline{X}$ errors by grade for EXT and FREQ items.

Fig. 8. $\overline{X}$ errors for S-ADV items.

Because of the differences in relation to the notion of 'implicit NEG,' the S-ADVs will be discussed separately from EXT and FREQ. Only Grades 1-5 will be considered for EXT and FREQ, since all eighth graders of interest here correctly explained these items.

In Table 11, presented earlier, comments made by first graders were listed as evidence for 'processing verb.' The comments on the EXT and FREQ items listed there are consistent with the error scores for this age group and support the notion that if the ADV is omitted in processing S, there is a greater likelihood of a wrong response.

For Grades 2 and 3, the error rate drops considerably for all items except seldom. For the other items, rarely, almost, and nearly, the patterns in the voluntary responses are consistent with those mentioned earlier for all items. The most obvious change from the first grade pattern is for the children to mention the ADV, either aloud but to themselves, or as a question, or to simply ask what the word means. There seems to be some correlation between this type of response and low error scores, but, of course, this is only an impression, since these data are not amenable to statistical analysis. But there can be no question that in this age range, the voluntary comments indicate an awareness that ADV is a factor in processing the S, and this would corroborate the significant decline in errors from Grade 1 to Grade 2. For the item seldom, where the error scores do not decline appreciably until Grade 5, the outstanding

observation was that the children in Grades 2 and 3 took an unusually long time to respond to this test-S, whether they eventually gave a right or wrong answer. The children with high error scores tended to ask what the word meant. As with the other items being discussed here, their comments tend to reinforce the notion of 'emerging ADV awareness' in this age group, or at the least, an awareness that all elements in the string must be processed.

The comments from Grade 5 are relevant in an obverse way: they tended not to volunteer any comments on these items (the exception again is seldom, where they also tended to ask what the word meant, though, of course, less often than the younger children). The reason why this particular finding is relevant is that it supports what I have suggested earlier: once the items have been mastered, as evidenced by the error scores, the children become less 'aware' of the fact that they are 'processing ADVs,' and consequently do not mention them.

The comments on S-ADVs are less clear-cut than those for EXT and FREQ, possibly because there is no dramatic change in error scores for these items until Grade 8. But there are still some interesting implications in the comments on these items.

The changes in the comments on S-ADVs for Grades 1, 2, and 3 are not notably different from those this age group made to the other 'implicit NEG' items. In general, the comments support the high error scores as 'processing S

without ADV.' The children in Grade 5 mentioned the S-ADV items somewhat more often than the younger children, but there was no evidence of a greater ability to explain these items, even though the error scores dropped for this age group. In fact, this group offered fewer explanations than the younger children with higher error scores (= wrong explanations). This could be taken as evidence of 'emerging awareness' of the ADV-class, especially in relation to the comments and explanations given by the eighth graders.

Since all of the Grade 8 subjects were asked to explain their responses, their data are particularly interesting. The comments of the seven subjects who made no errors, or errors only on S-ADV items, are listed in Table 13, along with their total error scores. A consideration of this table shows that, for these three items, even at an age that is generally considered to be 'linguistically adult,' some children obviously still have problems with S-ADVs. The comment made by 'Eileen' on the item perhaps is particularly interesting: it suggests that even at this age, children are not yet ready or able to make the fine distinctions required by 'modal' ADVs such as these. The comments made by the eighth graders may be the strongest argument for the relation between the objective error scores and the voluntary comments, but the progression is also important.

There were two children included in this study whose data I would like to compare, since they made such a vivid contrast on all of the measures that I have considered so far.

TABLE 13

Summary of Comments by Eighth Graders on S-ADVs

Item	Subject	Errors	Comments
probably	Becky	0	A - in B he obviously did
	Matt	0	A - because you don't see it happen
	Eileen	1	*B - because A is more intentional
	Michele	1	*hard to explain
	Bill	1	*in A he's going through him
	Gina	2	?Snoopy's walking behind
	Linda	2	*looks like he meant to do it in A
perhaps	Becky	0	A - in B she did
	Matt	0	perhaps? - can't tell if she did it in A
	Eileen	1	this is another one - don't like those 'perhaps' (items)
	Michele	1	?she grabbed it and ran
	Bill	1	A - doesn't show her doing it
	Gina	2	*because B-3 she's grabbing it
	Linda	2	in B she snatched it
maybe	Becky	0	maybe? - B (right reason)
	Matt	0	B - he maybe fell asleep, but can't say he didn't
	Eileen	1	B - in A 'Z's' show he's asleep
	Michele	1	B - in A he did
	Bill	1	maybe? - means I'm not sure, right? - B
	Gina	2	*maybe? - A-4 - he's asleep
	Linda	2	*A-4 he's asleep

* = wrong response
? = right response but comment suggests wrong reason

Derek, an eighth grader, made 6 errors, twice the number of any other eighth grader. This error score would place him, by extrapolation, at about fourth grade level. What is more, he gave wrong answers to just those items for which the third grade group had high error scores. His explanations for his responses were also similar to those given by third graders.

His scores on the 'Eighth Grade Test' were in the 31st percentile for reading and the 14th percentile for math. By contrast, Alexander, a second grader, made only 3 errors (rarely, perhaps, and maybe) compared to a grade mean of 8.4 errors (and a fifth grade mean error score of 4.8). I do not have an objective test score for this child, but these data, in conjunction with his comments, seem to indicate a superior mental ability. Alexander gave correct explanations for most of his responses, and so his low error score cannot be a statistical 'fluke,' especially considering those items to which he gave a wrong response.

The comparison of the data from these two children is a strong argument for the tie between the ability to process ADV and general cognitive development. In a narrow sense, these data substantiate the claim that error scores are corroborated by the ability to explain responses. In a much broader interpretation, the data from these two children argue for an 'age-free' acquisition process, which, of course, has implications beyond this study.

Summation of Results

The statistical analyses of the error scores from this study produced the following results:

1. The form of the test is not a significant variable.

2. The sex of the subject is not significant.

3. The ability to process the ADV items included here does change significantly between Grade 1 and 2 and between Grade 3 and 5.

4.   Because of a significant interaction between ADV form and ADV class, it is not possible to draw firm conclusions as to the effect of these variables individually, beyond saying that morphemic-MAN items were easiest for the age groups considered here, and morphemic-S-ADVs were the most difficult.   However, there are indications that ADV form is not a true factor in acquisition, but that ADV class may well be, and that the significant interaction in this study is a function of the particular items that were included.

5.   On the basis of the ANOCOVA results for the third grade, mental aptitude is a definite factor in the ability to process ADVs.

The informal analysis of the voluntary comments and responses made by the children tend to corroborate the statistical results.   The implications of these findings will be the subject of the next chapter.

Note

[1]The item _certainly_ needs special comment. It became clear to me during the testing sessions that the children were, for the most part, treating this item not as S-ADV, but as EXT, i.e., not as synonymous with 'I am certain' or 'I am sure,' but rather as a synonym of 'really,' 'a lot,' etc. For this reason, I think it is more reasonable to discuss the S-ADV results here in terms of only the three items which were true S-ADVs.

CHAPTER IV

DISCUSSION

Syntax, Semantics, and the Significant Interaction

Before discussing the syntactic and semantic results of
the study and their possible implications, it is necessary to
consider the significant interaction of form by class. No
firm statements can be made about either of the main effects
unless some logical explanation can be offered for the signif-
icant interaction. It is possible that factors not considered
in the statistical analyses could have influenced the results,
indicating that form and class interact when in fact they may
not.

The significant interaction is almost certainly a func-
tion of the experimental design. By insisting on equal cell
entries for the 2-form by 5-class array, and with the added
limitation of 1-word ADVs, the choice of possible items to
fill the cells was in several cases severely limited. The
ideal would have been a selection of items of equal frequency
or familiarity. But given the vagaries of language, this
was not possible. The best approximation was to fill the
cells with the most familiar items which met the basic
criteria. This tight experimental design exacted a price:
the statistically significant interaction of form and class.

A consideration of Table 14, which is a reduction of Table 9 (p. 40) demonstrates the point.

TABLE 14

Comparison of Duncan Groupings with Item $\overline{X}$'s

Class-Form	$\overline{X}$'s	Duncan[a] Grouping	Items	$\overline{X}$ Error Scores
FREQ-Morph.	0.47	B	seldom	0.76
			often	0.20
R.T.-ly	0.41	BC	finally	0.42
			suddenly	0.42
FREQ-ly	0.25	DE	rarely	0.41
			usually	0.12
R.T.-Morph.	0.15	EF	already	0.19
			still	0.12

[a]$\overline{X}$'s which do not share a common letter in the grouping are significantly different; those which do are not ($\alpha = 0.01$)

Table 14 shows that FREQ-Morph. is significantly more difficult than FREQ-ly, whereas R.T.-ly is significantly more difficult than R.T.-Morph. That is, for these two classes, there is apparently an inversion of difficulty by ADV form. But the statistical analyses were run on $\overline{X}$ error scores per cell. If the individual item $\overline{X}$'s are examined, the statistical differences appear to be more a function of the pooled $\overline{X}$'s than of real differences in difficulty. For FREQ, the individual item $\overline{X}$'s are widely divergent: seldom ($\overline{X} = 0.76$) ranks with S-ADV items (see Table 9, p. 40); often ($\overline{X} = 0.20$) ranks close to the R.T.-Morph. item already ($\overline{X} = 0.19$). The $\overline{X}$ for the FREQ-ly item rarely is almost

identical with the $\bar{X}$'s for the R.T.-ly items <u>finally</u> and <u>suddenly</u>, yet FREQ-ly and R.T.-ly are statistically different. The other FREQ-ly item, <u>usually</u>, has a $\bar{X}$ equal to that of the R.T.-Morph. item <u>still</u>.

The logical conclusions to be drawn from the statistically significant interaction of syntactic form by semantic class seems to be that 1) it is probably not 'real' but rather a function of the frequency/familiarity of individual items (to be expanded later), and 2) the major source of this significant interaction was the middle-difficulty classes: REL. TIME, FREQ, and EXT. Another rather obvious conclusion is that language does not readily fit the structured experimental designs favored by psychologists. The 'accidental gap' for the linguist can mean empty or inappropriately filled cells for the psycholinguist.

Even though the apparent form by class interaction can seemingly be explained away on logical grounds, at least for the items in this study, the other syntactic and semantic results can be legitimately discussed only in terms of trends and suggestions. But since it would be cumbersome and distracting to continually refer back to this proviso, the following discussion will assume this is understood, and will be presented in terms more positive than are strictly justified.

The syntactic question addressed in this study is very narrow. Basically, the question is: Are derived ADVs

acquired earlier than morphemic ADVs? The point of the
question is that, since an adult speaker of English obviously
has acquired the rule: ADJ+-ly=ADV, it might be the case
that, in the process of acquisition as the child becomes
aware of the rule, '-ly' items might be mastered earlier
than morphemic items. The evidence from this study indicates
that there is a small but significant difference in time of
acquisition for the two forms: the '-ly' forms were less
difficult than the morphemic forms. But somewhat of the
same situation holds for this result as was discussed in
relation to the significant interaction.

An examination of the individual item $\overline{X}$'s in Table 9
(p. 40) shows that the error score for 4 items, perhaps
($\overline{X}$ = 0.78), maybe ($\overline{X}$ = 0.76), probably ($\overline{X}$ = 0.78), and
seldom ($\overline{X}$ = 0.76) are almost double the scores for the next
most difficult items (finally and suddenly, $\overline{X}$ = 0.42). Three
of the four items are morphemic. It is possible that two
factors other than syntactic form could have contributed to
the statistically significant difference for form. The
first is level of conceptual difficulty: two of the items
are S-ADVs; the second is familiarity: many children indi-
cated they did not know the word seldom. Both of these
ideas will be developed in the next section on differences
between classes of ADV.

In sum, no substantial conclusions can be drawn from
this study in the area of syntax. It is possible that the

ADJ+-ly rule is functional in the early school years, but it is almost certainly not a major factor in ADV acquisition.

The semantic question, i.e., the question of the effect of ADV class in acquisition, is the one area in which the statistical analysis of error scores seems to provide some definitive answers. The results indicate that ADV class is a significant factor in acquisition, and that the 5 semantic classes can be divided in terms of 3 levels of cognitive difficulty. In brief, MAN items are easiest/earliest acquired; FREQ, REL. TIME, and EXT are 'middle-difficulty' items; and S-ADVs are the most difficult/last acquired. The reality of these 'levels' can be supported by evidence beyond the statistical results.

Even for the youngest children, error scores on MAN items were very low. There are two factors which might account for the earlier acquisition of MAN relative to other 'process-modifier' items. The first is that the concepts covered by these MAN items are conceptually more basic than the TIME/SPACE concepts covered by the 'middle-difficulty' items. This is supported by the work Ervin-Tripp (1970) did on WH-questions. Her findings showed that children can correctly answer _how_ questions before they can handle _when_ questions. One small piece of evidence from this study is that some of the Grade 1 children made comments such as 'This one is quiet/quick/happy' in indicating the correct panel for the MAN-ly items.

The second reason involves the relation between ADJ and ADV and the notion that items are processed if and when they are understood. For the MAN items in this study, the similarity to ADJ is much stronger than for any of the other classes: all of the MAN-morph. items are phonetically identical to their ADJ counterparts. It could be that the younger children were dealing with the string containing MAN-ADV as they would a string with ADJ, and are not necessarily exhibiting an ability to process ADV. This subject will be discussed further in the final section of this chapter.

The 'middle-difficulty' items, which cover the classes REL. TIME, FREQ, and EXT, present the most difficult problems of interpretation and extrapolation. The general conclusion to be drawn from the data on these classes is that the individual item is in some way more important than either syntactic form or semantic class. For example, consider the items in the FREQ class: seldom ($\overline{X} = 0.76$), often ($\overline{X} = 0.20$), rarely ($\overline{X} = 0.41$), and usually ($\overline{X} = 0.12$). Seldom and rarely are synonymous but the $\overline{X}$'s for these items are quite different, and much higher than the $\overline{X}$'s for the other 2 items. They are, of course, different in syntactic form, but then consider the items almost ($\overline{X} = 0.26$) and nearly ($\overline{X} = 0.31$), also synonymous, but different in syntactic form, yet with $\overline{X}$'s that are virtually the same. It is an interesting sidelight that, during the testing sessions, some of the

older children, usually the fifth graders, asked, 'What does seldom/rarely mean?' When told 'not very often' their response was 'Oh, then it's (correct panel).'

This predominance of item over class or form is also evident for the following items with virtually identical $\overline{X}$'s: finally/suddenly ($\overline{X}$ = 0.42), which are REL. TIME-ly; rarely ($\overline{X}$ = 0.41), which is FREQ-ly; and only ($\overline{X}$ = 0.41), which is EXT-morph. On the basis of the data, the final conclusion for these 'middle-difficulty' items must be that 1) the items and the concepts they cover are acquired during the early school years, since the Grade 1 children made many errors on these items and the Grade 8 children made none; 2) there is probably some scale of difficulty for the concepts covered by these classes; 3) it is not possible to determine from the results of this study just what that scale might be.

The data on S-ADVs were unquestionably the most conclusive and, in many ways, the most interesting results of the study. This class of ADVs was consistently most difficult for Grades 1-5, for which there are statistical data, but it was also somewhat of a problem for some of the children in Grade 8, as indicated by their comments and their error scores. These results are not surprising: S-ADV, as a proposition modifier, was expected to be cognitively more difficult than the 'process-modifier' items. This expectation was based on general notions from language acquisition

studies which indicate that the child develops from specific
to general concepts, but more specifically, the analysis of
S-ADVs presented by Schreiber (1970), mentioned briefly in
Chapter I. Schreiber's suggestions deserve further consid-
eration in light of the results of this study. According
to his analysis, S-ADVs fall into two categories: 'modal'
and 'evaluative.' Modal items (e.g., apparently, clearly,
obviously) indicate 'degree of surety' on the part of the
speaker. Evaluative items (fortunately, oddly, naturally),
on the other hand, express the speaker's opinion on the
statement being made. In order to correctly process S-ADVs
the child must reach the point where he is able to recognize
that these items represent a 'comment on the proposition,'
and that the comment represents either speaker opinion or
speaker surety of the factual nature of the proposition. But
there is a further complication, in relation to acquisition,
from Schreiber's analysis. With modal S-ADVs, the proposi-
tion is not necessarily 'fact.' With evaluative items, it
is. Consider the following Ss:

    42. Presumably, Snoopy fell off the doghouse.

    43. Regrettably, Snoopy fell off the doghouse.

In S-42, the event mentioned may or may not have actually
occurred; in S-43, it is implicitly considered true. In
sum, before the child can correctly process S-ADVs, he has
to infer some rather sophisticated notions, restrictions and
extrapolations (in terms of implicit information).[1]

Given Schreiber's analysis, and the results of this study, the comments made by the eighth graders are particularly interesting (see Table 13, p. 57). The 2 children who made no errors on the test gave good explanations for all the S-ADV items. The comments of the other 5 children who gave incorrect answers to 1 or 2 of the S-ADV items seem to indicate that these children are partially aware of the special function of S-ADV (as opposed to 'process-modifier'), but that they do not yet fully understand the implication of these items.

It should be noted that all S-ADV items in this study were 'modal' by Schreiber's analysis, and so no unqualified statement can be made as to the class in general. Still it seems that once the function of S-ADV is recognized, both 'modal' and 'evaluative' ADVs should be acquired at about the same time. That is, since all S-ADVs represent 'speaker comment,' once the child becomes aware of this function, he should be able to handle both types of S-ADVs. Nevertheless it remains an interesting empirical question.

ADV Acquisition and Cognitive Development

The final question posed in Chapter I concerned the possible relationship between ADV acquisition and cognitive development. The statistical results for ANOVA and ANOCOVA, as well as the informal analysis of the voluntary comments, relate to this question. The sum of the evidence indicates

that there is a strong tie between cognitive level and the ability to process ADVs.

The analysis of the error scores showed a significant decrease in errors between Grades 1 and 2 and Grades 3 and 5. For Grade 8 there were no errors, except the few on S-ADV items. Clearly, facility with ADVs improves with age, but this does not necessarily imply a direct connection between that improved ability and cognitive development. The older children have had proportionately greater exposure to the various items. It is a question of whether the improvement is more a reflection of familiarity or of a developing aware- ness of the basic function of ADV. The ANOCOVA results are relevant here. They indicate a significant correlation be- tween test scores and mental ability for one age group. Assuming all 7-year-olds have had about the same exposure to ADV, we can tentatively conclude that it is primarily level of cognitive development that is the major factor in the significant improvement across grades.

The analysis of the voluntary data provides further support for this conclusion. The children in Grade 2 and above were increasingly able to correctly explain their responses. They were demonstrating an increasing awareness of the basic function of ADV, and also of the concepts covered by the particular ADV items.

Finally, there is some outside evidence to support this conclusion. Loban (1963, 1964) found a close relationship

between mental ability and use of ADVs, both in number and
form, for grade school children. He used a 'finish the
sentence' type task involving adverbial connectives for
Grades 5-9. Children in the high ability group did well
even at Grade 5, whereas the low ability group were consis-
tently poorer through Grade 9. Clearly, there is a close
connection between ADV acquisition and cognitive development
that deserves to be investigated in more detail.

Stages in ADV Acquisition

The major result of this study is that, if the various
forms of data are integrated, certain stages in the acquisition
of ADV become apparent. The statistically significant results
say that ADV acquisition relates to age (ANOVA) and to mental
aptitude (ANOCOVA). The voluntary comments were even more
interesting, and more illuminating, in suggesting just how
ADV acquisition relates to general cognitive development.
In sum, an overall view of ADV acquisition seems to emerge.
This view can be presented in terms of 'stages' which relate
to degree of 'awareness' and apparent strategies for processing
Ss with ADV.[2]

Stage 1: unaware/ignoring ADV

For the youngest children in this study, the concepts
underlying many of the ADV items were evidently beyond their
level of cognitive development. Therefore, the apparent
strategy was to process the string without the ADV. This

would account for the observation that the younger children tended to quickly and enthusiastically point to the critically wrong frame for implicit NEG items: the choice is so obvious if the ADV is not considered! There is evidence that this proposed stage is present in other areas of acquisition. Fraser, Bellugi, and Brown (1963) found that young children tended to interpret a S such as the girl is pushed by the boy to mean that the girl was doing the pushing. The assumption is that, if the passive formation is not yet understood, those items in the S which make it passive are ignored, and the S is processed as active. Smith (1970) also found evidence of what she calls 'selective listening' in 3- and 4-year-olds in repetition and response studies. The conclusion was that the children repeated or responded according to those elements of the test S that they understood. Keller-Cohen (1975) reached a similar conclusion in her investigation of temporal connectives. Her subjects, who evidently did not understand the item while, substituted before, after or and then in their repetitions of test sentences containing while. There seems to be a consistent--or at least, prevalent--strategy in acquisition, across syntax and semantics, to process strings according to the current level of linguistic and/or cognitive development.

Stage 2: Partially aware/guessing at ADV

At some point, typically around the Grade 2 level, the child seems to begin to recognize that all elements in a

string have some significance. But since the general con-
cepts behind many of the ADVs are still beyond his compre-
hension, there is a tendency to guess. There is additional
evidence of this 'partial awareness' in that children at
this stage often repeat the ADV aloud but to themselves or
repeat it as a question. They still process the S without
ADV, but without the surety (for the wrong response) exhibited
by the children in the previous stage.

Stage 3: Aware/asking about ADV

At this point the child does recognize that all elements
in the string are necessary for correctly processing the
string. It is at this stage that the child either responds
correctly or asks directly what the ADV means. Correct re-
sponses are often explained by defining or referring to the
ADV.

Stage 4: Unaware/comprehending ADV

This is not truly a 'stage,' unless it can be considered
the final stage, but rather some observations on typical be-
havior when ADV acquisition is virtually complete. The term
'unaware' reflects the fact that, once the basic function of
ADV is comprehended, the ADV is rarely mentioned voluntarily,
in sharp contrast to the 2 earlier stages. That is, the
more complete the ability to process ADV, the less aware the
child seems to be that he is doing so! It is an interesting
sidelight that most of the eighth graders who made few if

any errors and correctly explained their responses, asked
after the test session just what I was studying, and were
surprised to learn that it was ADV.

There is an important point that needs to be made here,
and that is, that these stages are not directly linked to
chronological age, syntactic form, or semantic class. Rather
they apparently relate most directly to an emerging sense of
the basic function of ADV. This 'sense of ADV function' is
in turn apparently correlated with cognitive development.

The contention that ADV acquisition is more closely
related to mental ability than to chronological age is sup-
ported by the ANOCOVA results for Grade 3, which showed a
significant relation between errors on the test and OLMAT
scores. The comparison of the error scores and voluntary
comments for the gifted second grader and the exceptional
eighth grader give additional support to this contention.

The statistical results of this study do not relate to
the question of syntactic form in these proposed stages.
The fact is that the syntactic dimensions of the study were
too narrow to make any conclusive statement. But the evi-
dence from the studies mentioned in Chapter I on the language
of elementary school children, in particular, Loban (1963,
1964), suggest that children's use, and presumably compre-
hension, of more advanced syntactic forms increases with
grade into the high school years.

For the semantic dimension of ADV, the logical conclu-
sion seems to be that the stages would apply almost on the

level of individual items, but with certain predictable over-
laps. The evidence that some items within a given class were
more difficult than others in the same is the complicating
factor. Of course, this applies primarily to TIME and EXT
items; the MAN and S-ADV, in terms of statistical results and
analysis of voluntary comments, fit well with this stage
theory. For the TIME and EXT items, more detailed investiga-
tion is needed. But the error scores, in conjunction with
voluntary comments for those items discussed under 'implicit
NEG' in Chapter III do support the stages.

The evidence for the existence of the 'stages' in ADV
acquisition proposed here is strong, but not conclusive.
It is important to recognize that no claim has been made
that a child, at whatever age, is exclusively in one stage
with respect to general ADV processing. Rather, the impli-
cation is that a child--at least, beyond Stage 1--goes through
the progressive stages almost on an item basis. There are,
of course, indications that the less complex MAN items will
be mastered first, and the S-ADV items last. But in between,
the predictable patterns for ADV, based on this study, are
that the typical child will be in various stages at any given
point, relative to ADV class and form. It is most probable
that the child handles individual ADVs at a given level
dependent upon the syntactic and semantic complexity of the
specific ADV item.

Notes

[1]Schreiber's paper offers some interesting suggestions on syntactic complexity of S-ADV. In fact, that is the major premise of the paper. He also suggests some ways in which syntax and semantics interact for S-ADVs.

[2]The term 'awareness' needs to be defined as it is used in this paper. It does _not_ imply any conscious level in language processing. Rather, it refers to a logical way of categorizing the reactions/responses of the children to this test.

CHAPTER V

SUMMARY AND CONCLUSIONS

Review of Purpose and Questions

There is ample evidence that the category ADV is a
major problem in the linguistic description of English.
There is also good reason to believe that data on acquisi-
tion can provide important insights for the descriptive
linguist. But the data on ADV acquisition is minimal. For
the most part, it must be derived from incidental evidence
in studies with primary emphasis on other questions or areas
of acquisition. The purpose of the present study was to
look directly at ADV acquisition: to look at some of the
more basic aspects of ADV in relation to acquisition, and
to establish some guidelines for more detailed investigations.
The elemental questions addressed in the study relate to the
basic function of ADV, to the relative importance of syntax
and semantics in the acquisition of ADV, and to the possible
relation between ADV acquisition and cognitive development.

General Conclusions

The statistical results of the study are ambiguous in
some cases, but certain general conclusions, based on an
integrated interpretation of error scores and voluntary

comments, can be drawn. There may be some slight advantage of '-ly' items over morphemic ADVs in the process of acquisition. And it is possible that ADV form and class interact--at least they did statistically for the items in this study. On the other hand, it seems sure that semantic class is the most important factor in acquisition. The S-ADVs were the most difficult of the classes considered here, and MAN the least difficult. No definite statement can be made relative to EXT, FREQ, and REL. TIME.

The most conclusive statement that can be made from this study is that there is a strong connection between ADV acquisition and cognitive development. Error scores decrease with advancing grades: older children as a group are better able to process ADV than are younger children. This is not so surprising, but consider that error scores for children in the same grade are directly related to their mental aptitude scores. The decrease in error scores by grade is almost surely attributable to increase in cognitive level, and not to other factors such as increased exposure to ADV. Perhaps the most interesting conclusion drawn from the study was that there appear to be stages in ADV acquisition which relate in certain definite ways to other areas of acquisition.

Projections

This study represented a first attempt at an organized investigation of children and ADVs. The results provided some

general guidelines for future research in this area. More
importantly, the results suggest certain issues and specific
questions in the area of ADV acquisition that deserve special
attention.

Since this study was confined to 1-word ADVs, the initial
question is whether the use of phrasal ADVs, which are para-
phrases of the items included here, might permit a more de-
tailed description of the development of time and space con-
cepts. A further question relates to whether the stages that
were apparent in this study can be verified and defined in
more detail. That stages exist in early language is well-
documented, and so it is to be expected they are also a part
of later acquisition. In fact, Chomsky (1969) found that in
her ask/tell studies there was evidence of a steady progres-
sion in comprehension. Chomsky also mentioned another aspect
of this 'progression' that was apparent in this study as well:
that it is not linked to chronological age. This is an im-
portant consideration that is sometimes overlooked in studies
of child language. Unless the N is quite large, mental age
is more likely to be a critical factor than is chronological
age.

A final consideration is that of methodology. The test
used here worked well for the specific questions being con-
sidered. It was evident, however, that it was not appropriate
for children under 6, or below first grade. It would seem
that an adaption of the imitation/repetition method that has

been so productive with young children in other areas of acquisition should work equally well with ADVs. For older children, more information could possibly be obtained by requiring subjects to explain how the panel sets differed. This method seems especially appropriate to explain in more detail the results that Loban (1963, 1964) found: that for older children, there is an increase in both the frequency of ADV usage, but more interestingly, an increase in the different types of syntactic form of ADV.

APPENDIX A

Test Ss for Form 1

1. Charlie Brown threw the ball straight.
2. Snoopy carefully put the bird in the nest.
3. Linus only hit the ball.
4. Schroeder quietly played the piano.
5. Lucy suddenly hit Linus.
6. Probably Snoopy bumped into Linus.
7. Charlie Brown already jumped in the leaves.
8. Linus went to bed fast.
9. Charlie Brown seldom watches TV.
10. Perhaps Sally grabbed the blanket.
11. Linus usually helps his mother.
12. Snoopy almost grabbed the blanket.
13. Certainly the cat scared Snoopy.
14. Lucy rarely plays with Linus.
15. Snoopy nearly fell off his doghouse.
16. Charlie Brown flew the kite high.
17. Lucy happily listened to Schroeder play.
18. The fire completely burned Snoopy's doghouse.
19. Lucy is still talking on the phone.
20. Linus finally found his blanket.
21. Schroeder often reads books.
22. Snoopy quickly ran to kick the ball.
23. Lucy hit Linus hard.
24. Maybe Snoopy fell asleep on his doghouse.

Test Ss for Form 2

1. Charlie Brown threw the ball straight.
2. Snoopy carefully put the bird in the nest.
3. Linus only hit the ball.
4. Schroeder quietly played the piano.
5. Lucy finally hit Linus.
6. Perhaps Snoopy bumped into Linus.
7. Charlie Brown already jumped in the leaves.
8. Linus quickly went to bed.
9. Charlie Brown usually watches TV.
10. Probably Sally grabbed the blanket.
11. Linus seldom helps his mother.
12. Snoopy nearly grabbed the blanket.
13. Maybe the cat scared Snoopy.
14. Lucy often plays with Linus.
15. Snoopy almost fell off his doghouse.
16. Charlie Brown flew the kite high.
17. Lucy happily listened to Schroeder play.
18. The fire completely burned Snoopy's doghouse.
19. Lucy is still talking on the phone.
20. Linus suddenly found his blanket.
21. Schroeder rarely reads books.
22. Snoopy ran fast to kick the ball.
23. Lucy hit Linus hard.
24. Certainly Snoopy fell asleep on his doghouse.

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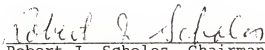Fraser, James B. 1965. An examination of verb-particle constructions in English. Ph.D. dissertation, M.I.T.

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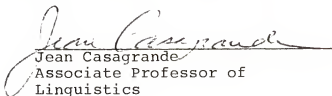
BIOGRAPHICAL SKETCH

Joeann Chandlee Paige was born on April 3, 1934, in Wilmington, Delaware. She earned a classical diploma from the Ursuline Academy in Wilmington in June, 1951, and entered the University of Delaware in September, 1951. She completed her undergraduate work for the Bachelor of Arts degree in January, 1955, and was accepted directly into the graduate school at Delaware. In September, 1955, she entered the graduate program in Experimental Psychology at Tufts University in Medford, Massachusetts, with a two-year teaching assistantship. She received her Master of Science degree from Tufts in October, 1957, but remained at the school as assistant investigator on a government-funded project. In June of 1958, she accepted a position at the I.B.M. Research Laboratory in San Jose, California, as Associate Engineering Psychologist, a position she held for three years. She is married to Arnold Paige, a professor of Electrical Engineering at the University of Florida. They are the parents of three children.

I certify that I have read this study and that in my opinion it conforms to acceptable standards of scholarly presentation and is fully adequate, in scope and quality, as a dissertation for the degree of Doctor of Philosophy.
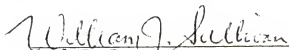
Robert J. Scholes, Chairman
Professor of Linguistics
and Speech

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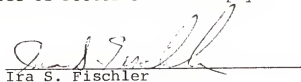
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I certify that I have read this study and that in my opinion it conforms to acceptable standards of scholarly presentation and is fully adequate, in scope and quality, as a dissertation for the degree of Doctor of Philosophy.

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This dissertation was submitted to the Graduate Faculty of
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December 1978

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